Claims 8-11, 16-20, and 22-27 are withdrawn from consideration. Please amend claim 1 and cancel claim 6 as follows.

1. (Currently Amended) A method of maintaining phase-matching criteria of an acousto-optic device during temperature variations, the method comprising:

a) measuring a delay time of a surface acoustic wave propagating between a first and a second SAW transducer on an acousto-optic device at a plurality of locations on the acousto-optic device to determine an average surface temperature;

b) generating a control signal in response to the average surface temperature ~~measured delay time, the control signal being a function of a measured temperature of the acousto-optic device and a wavelength that corresponds to a phase-matching criteria of the acousto-optic device~~; and

c) changing a frequency of a signal applied to an acoustic wave transducer positioned on the acousto-optic device in response to the control signal, the frequency of the signal being chosen to maintain the phase-matching criteria of the acousto-optic device.

2. (Cancelled)

3 (Cancelled)

4. (Cancelled)

5. (Cancelled)

6. (Cancelled)

7. (Cancelled)

8. (Withdrawn) The method of claim 1 wherein the signal applied to the acoustic wave transducer maintains the phase-matching criteria when a

birefringence in at least one optical waveguide in the acousto-optic tunable device changes.

9. (Withdrawn) The method of claim 1 wherein the signal applied to the acoustic wave transducer maintains the phase-matching criteria when a speed of sound in at least one optical waveguide in the acousto-optic tunable device changes.

10. (Withdrawn) An acousto-optic tunable device comprising:

a) an acousto-optic substrate;

b) an acoustic wave transducer positioned on the acousto-optic substrate;

c) a first and a second SAW transducer that are positioned on the acousto-optic substrate, the first SAW transducer generating an acoustic wave and the second SAW transducer receiving the acoustic wave generated by the first SAW transducer and generating a voltage signal at an output that is proportional to a strength of the received acoustic wave;

d) a processor having an input that is electrically coupled to the output of the second SAW transducer, the processor generating a control signal at an output in response to the voltage signal generated by the second SAW transducer; and

e) an oscillator having a control input that is electrically coupled to the output of the processor and having an output that is electrically coupled to the acoustic wave transducer, a frequency of the oscillator being changed in response to the control signal in order to maintain phase-matching criteria of the acousto-optic tunable device as the temperature of the acousto-optic substrate changes.

11. (Withdrawn) The acousto-optic tunable device of claim 10 wherein the acousto-optic tunable device comprises an acousto-optic tunable filter.

12. (Cancelled)

13. (Cancelled)

14. (Cancelled)

15. (Cancelled)

16. (Withdrawn) The acousto-optic tunable device of claim 10 wherein the oscillator comprises a smoothing filter.

17. (Withdrawn) The acousto-optic tunable device of claim 10 wherein the oscillator comprises a digital frequency synthesizer.

18. (Withdrawn) The acousto-optic tunable device of claim 10 wherein the control signal is a function of the temperature of the acousto-optic substrate and a desired phase matching wavelength of the acousto-optic tunable device.

19. (Withdrawn) The acousto-optic tunable device of claim 10 wherein the frequency of the oscillator is changed in order to maintain the phase-matching criteria when a birefringence in at least one optical waveguide in the acousto-optic tunable device changes.

20. (Withdrawn) The acousto-optic tunable device of claim 10 wherein the frequency of the oscillator is changed in order to maintain the phase-matching criteria when a speed of sound in at least one optical waveguide in the acousto-optic tunable device changes.

21 (Cancelled)

22. (Withdrawn) The acousto-optic tunable device of claim 10 wherein the first and the second SAW transducers comprise a first and a second set of inter-digitated conducting fingers.

23. (Withdrawn) The acousto-optic tunable device of claim 10 wherein the first and the second SAW transducers are in close physical proximity to a region where optical mode conversion occurs in the acousto-optic substrate.

24. (Withdrawn) The acousto-optic tunable device of claim 10 wherein the acoustic wave generated by the first SAW transducer does not overlap with a mode-converting acoustic wave.

25. (Withdrawn) The acousto-optic tunable device of claim 10 wherein the first and the second SAW transducers comprise a SAW oscillator.

26. (Withdrawn) The acousto-optic tunable device of claim 25 wherein the SAW oscillator further comprises an amplifier having an input that is electrically connected to an output of the second SAW transducer and having an output that is electrically connected to the output of the first SAW transducer.

27. (Withdrawn) The acousto-optic tunable device of claim 10 wherein the processor comprises a frequency counter.

28. (Previously Presented) An acousto-optic tunable device comprising:

a) an acousto-optic substrate;

b) an acoustic wave transducer positioned on the acousto-optic substrate;

c) a SAW oscillator having a first transducer and a second transducer that are positioned in the acousto-optic substrate, the SAW oscillator generating a SAW oscillator signal at an output having a frequency that is related to a temperature of the acousto-optic substrate;

d) a frequency counter having an input that is electrically connected to the output of the SAW oscillator, the frequency counter generating a signal at an output that is related to the frequency of the SAW oscillator signal;

e) a processor having an input that is electrically coupled to the output of the frequency counter, the processor generating a control signal at an output in response to the signal generated by the frequency counter; and

f) an oscillator having a control input that is electrically coupled to the output of the processor and having an output that is electrically coupled to the acoustic wave transducer, a frequency of the oscillator being changed in response to the frequency of the SAW oscillator frequency in order to maintain phase-matching criteria of the acousto-optic tunable device as the temperature of the acousto-optic substrate changes.